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an analog-to-digital converter to convert an analog signal received by the active antenna element into a digital signal by oversampling the analog signal at a predetermined period,

said control unit having an adjusting part to adjust reactances of the variable reactances to minimize or maximize the evaluation function, by defining as the evaluation function a correlation coefficient which is obtained from a correlation of the digital signal and a known signal having a predetermined pattern.

7. (original) The array antenna control apparatus as claimed in claim 4, comprising:

an adjusting unit to adjust phases and amplitudes of incoming signals arriving at the plurality of antenna elements; and

an analog-to-digital converter to convert analog signals received by the plurality of antenna elements into digital signals by oversampling the analog signals at a predetermined period,

said control unit comprising an adjusting part to adjust the phases and amplitudes to minimize or maximize the evaluation function, by defining as the evaluation function a correlation coefficient which is obtained from a correlation of the digital signals and a known signal having a predetermined pattern.

8. (original) The array antenna control apparatus as claimed in claim 7, comprising:

a radio frequency processing part coupled to the plurality of antenna elements, and including said adjusting unit.

9. (original) The array antenna control apparatus as claimed in claim 7, wherein said adjusting unit adjusts the phases and the amplitudes digitally or in analog form.

10. (original) The array antenna control apparatus as claimed in claim 4, comprising:

an adjusting unit to adjust phases of incoming signals arriving at the plurality of antenna elements; and

an analog-to-digital converter to convert analog signals received by the plurality of antenna elements into digital signals by oversampling the analog signals at a predetermined period,

said control unit comprising an adjusting part to adjust the phases to minimize or maximize the evaluation function, by defining as the evaluation function a correlation coefficient which is obtained from a correlation of the digital signals and a known signal having a predetermined pattern.

11. (original) The array antenna control apparatus as claimed in claim 6, wherein said adjusting part of the control unit adjusts the reactances of the variable reactances to minimize or maximize the evaluation function based on a gradient vector of the correlation function.

12. (original) The array antenna control apparatus as claimed in claim 7, wherein said adjusting part of the control unit adjusts the phases and the amplitudes to minimize or maximize the evaluation function based on a gradient vector of the correlation function.

13. (original) The array antenna control apparatus as claimed in claim 4, wherein incoming signals arriving at the plurality of antenna elements have been transmitted by multicarrier transmission.

14. (original) The array antenna control apparatus as claimed in claim 6, comprising:

base converter to convert a time-based digital signal which is described in a time-domain and output from said analog-to-digital converter into a frequency-based digital signal which is described in a frequency-domain,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of the frequency-based digital signal and a frequency-based known signal.

15. (original) The array antenna control apparatus as claimed in claim 7, comprising:

base converter to convert a time-based digital signal which is described in a time-domain and output from said analog-to-digital converter into a frequency-based digital signal which is described in a frequency-domain,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of the frequency-based digital signal and a frequency-based known signal.

16. (original) The array antenna control apparatus as claimed in claim 6, wherein said adjusting part of the control unit defines as the evaluation function a correlation coefficient

which is obtained from a correlation of a time-based digital signal which is described in a time-domain and output from said analog-to-digital converter and a time-based known signal.

17. (original) The array antenna control apparatus as claimed in claim 7, wherein said adjusting part of the control unit defines as the evaluation function a correlation coefficient which is obtained from a correlation of a time-based digital signal which is described in a time-domain and output from said analog-to-digital converter and a time-based known signal.

18. (original) The array antenna control apparatus as claimed in claim 6, wherein the known signal is generated from a signal for transmitting control information within a frame employed by a predetermined system or protocol.

19. (original) The array antenna control apparatus as claimed in claim 7, wherein the known signal is generated from a signal for transmitting control information within a frame employed by a predetermined system or protocol.

20. (original) The array antenna control apparatus as claimed in claim 6, comprising:

an impulse response obtaining unit to obtain an impulse response of a transmission path; and

a reference signal generator to generate a frequency-based reference signal which is described in a frequency-domain, by performing a Fourier transform on a convolution of the impulse response and a time-based known signal which is described in a time-domain,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of a frequency-based digital signal which is output from said analog-to-digital converter and the frequency-based reference signal.

21. (original) The array antenna control apparatus as claimed in claim 7, comprising:

an impulse response obtaining unit to obtain an impulse response of a transmission path; and

a reference signal generator to generate a frequency-based reference signal which is described in a frequency-domain, by performing a Fourier transform on a convolution of the impulse response and a time-based known signal which is described in a time-domain,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of a frequency-based digital signal which is output from said analog-to-digital converter and the frequency-based reference signal.

22. (original) The array antenna control apparatus as claimed in claim 6, comprising:

an impulse response obtaining unit to obtain an impulse response of a transmission path; and

a reference signal generator to generate a time-based reference signal which is described in a time-domain, by performing a Fourier transform on a convolution of the impulse response and a time-based known signal,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of a time-based digital signal which is output from said analog-to-digital converter and the time-based reference signal.

23. (original) The array antenna control apparatus as claimed in claim 7, comprising:

an impulse response obtaining unit to obtain an impulse response of a transmission path; and

a reference signal generator to generate a time-based reference signal which is described in a time-domain, by performing a Fourier transform on a convolution of the impulse response and a time-based known signal,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of a time-based digital signal which is output from said analog-to-digital converter and the time-based reference signal.

24. (original) The array antenna control apparatus as claimed in claim 14, comprising:

a profile obtaining unit to obtain a delay profile statistically describing instantaneous characteristics of a transmission path; and

a reference signal generator to generate a frequency-based reference signal which is described in a frequency-domain, by performing a Fourier transform on a time-based reference signal which is described in a time-domain and generated based on the delay profile,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of the frequency-based digital signal which is output from said base converter and the frequency-based reference signal.

25. (original) The array antenna control apparatus as claimed in claim 15, comprising:

a profile obtaining unit to obtain a delay profile statistically describing instantaneous characteristics of a transmission path; and

a reference signal generator to generate a frequency-based reference signal which is described in a frequency-domain, by performing a Fourier transform on a time-based reference signal which is described in a time-domain and generated based on the delay profile,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of the frequency-based digital signal which is output from said base converter and the frequency-based reference signal.

26. (original) The array antenna control apparatus as claimed in claim 6, comprising:

a profile obtaining unit to obtain a delay profile statistically describing instantaneous characteristics of a transmission path; and

a reference signal generator to generate a time-based reference signal which is described in a time-domain, based on the delay profile,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of a time-based digital signal which is output from said analog-to-digital converter and the time-based reference signal.

27. (original) The array antenna control apparatus as claimed in claim 7, comprising:

a profile obtaining unit to obtain a delay profile statistically describing instantaneous characteristics of a transmission path; and

a reference signal generator to generate a time-based reference signal which is described in a time-domain, based on the delay profile,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of a time-based digital signal which is output from said analog-to-digital converter and the time-based reference signal.

28. (original) The array antenna control apparatus as claimed in claim 14, comprising:

a transfer function obtaining unit to obtain a transfer function describing instantaneous characteristics of a transmission path in a frequency-domain; and

a reference signal generator to generate a frequency-based reference signal, based on the transfer function,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of the frequency-based digital signal which is output from said base converter and the frequency-based reference signal.

29. (original) The array antenna control apparatus as claimed in claim 15, comprising:

a transfer function obtaining unit to obtain a transfer function describing instantaneous characteristics of a transmission path in a frequency-domain; and

a reference signal generator to generate a frequency-based reference signal, based on the transfer function,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of the frequency-based digital signal which is output from said base converter and the frequency-based reference signal.

30. (original) The array antenna control apparatus as claimed in claim 6, comprising:

a transfer function obtaining unit to obtain a transfer function describing instantaneous characteristics of a transmission path in a frequency-domain; and

a reference signal generator to generate a time-based reference signal which is described in a time-domain, by performing a Fourier transform on a frequency-based reference signal which is described in a frequency-domain and generated based on the transfer function,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of the time-based digital signal which is output from said analog-to-digital converter and the time-based reference signal.

31. (original) The array antenna control apparatus as claimed in claim 7, comprising:

a transfer function obtaining unit to obtain a transfer function describing instantaneous characteristics of a transmission path in a frequency-domain; and

a reference signal generator to generate a time-based reference signal which is described in a time-domain, by performing a Fourier transform on a frequency-based reference signal which is described in a frequency-domain and generated based on the transfer function,

said adjusting part of the control unit defining as the evaluation function a correlation coefficient which is obtained from a correlation of the time-based digital signal which is output from said analog-to-digital converter and the time-based reference signal.

32. **(currently amended)** An array antenna control apparatus for controlling an array antenna part having a plurality of antenna elements arranged at a predetermined interval, comprising:

control means comprising means for obtaining a predetermined evaluation function with respect to each of weighting coefficients to be applied to incoming signals arriving at a ~~predetermined number~~plurality of antenna elements, by perturbing each of the weighting coefficients at a sampling interval which is within one symbol time, and means for adjusting each of the weighting coefficients based on the evaluation function.

33. **(currently amended)** A computer-readable storage medium which stores a program for causing a computer to control an array antenna part having a plurality of antenna elements arranged at a predetermined interval, said program comprising:

a procedure causing the computer to obtain a predetermined evaluation function with respect to each of weighting coefficients to be applied to incoming signals arriving at a ~~predetermined number~~plurality of antenna elements, by perturbing each of the weighting coefficients at a sampling interval which is within one symbol time; and

a procedure causing the computer to adjust each of the weighting coefficients based on the evaluation function.